

REMARKS

The rejection of Claims 1, 2, 4-12, and 17-22 under 35 U.S.C. § 103(a) as unpatentable over US 6,299,977 (Takeyama et al) in view of US 4,525,169 (Higuchi et al) and JP 09-59881 (Ashida et al), and further evidenced by US 4,914,764 (Mast et al), is respectfully traversed.

As recited in above-amended Claim 1, the present invention is a suede artificial leather comprising a three-dimensional entangled body comprising a superfine fiber having a fineness of 0.2 dtex or less and an elastomeric polymer A impregnated in the three-dimensional entangled body, the suede artificial leather satisfying the following requirements (1) to (4):

(1) a pigment A in an amount of 0.1 to 8% by mass is embedded in the superfine fiber, wherein the pigment A is at least one pigment selected from the group consisting of an organic pigment having an average particle size of 0.01 to 0.3 μm and carbon black having an average particle size of 0.01 to 0.3 μm ;

(2) a pigment B in an amount of 1 to 20% by mass is embedded in the elastomeric polymer A, wherein the pigment B is at least one pigment selected from the group consisting of an organic pigment having an average particle size of 0.05 to 0.6 μm and carbon black having an average particle size of 0.05 to 0.6 μm , or the pigment B is a pigment particle having an average particle size of 0.05 to 0.6 μm which comprises a mixture of an organic pigment with carbon black or at least one inorganic pigment, and wherein the elastomeric polymer A is derived from a water-dispersed polyurethane substantially free from organic solvents, the polyurethane comprising an aliphatic diisocyanate or alicyclic diisocyanate as its diisocyanate component and having a hot water swelling rate of 20% or less when measured immediately after immersion to a hot water of 130°C;

(3) the ratio of the elastomeric polymer A to the three-dimensional entangled body is 15:85 to 60:40 by mass; and

(4) an average raised nap length of the superfine fiber present on the surface of the suede artificial leather is 10 to 200 μm .

Applicants submit that the invention herein, as previously claimed prior to the above-discussed amendment, is patentable over the applied prior art for reasons discussed in previous responses, since the above-stated rejection is not a new ground of rejection. These reasons are hereby incorporated by reference. The above-discussed amendment provides even further reasons for patentability, for reasons now discussed.

The Examiner concedes that Takeyama et al is silent as to the use of pigments for use in coloring artificial leather. The Examiner thus relies upon Higuchi et al, Ashida et al and Mast et al to remedy this deficiency. However, as discussed below, neither Higuchi et al nor Ashida et al nor Mast et al, alone or in combination, remedy these deficiencies.

The Examiner finds Higuchi et al discloses:

As demonstrated in Example 1 (col. 8, lines 58-61 and col. 9, lines 28-33) polyurethane with pigments imbedded [sic] pigment may be used to impregnate the artificial leather at a level of 0.5 percent.

In reply, however, polyurethane is impregnated into the artificial leather in the form of a solution in an organic solvent such as dimethylformamide (column 8, lines 58-60 and column 11, lines 42-43). In contrast, a water-dispersed polyurethane substantially free from organic solvents is now required in the presently-claimed invention.

As described in the specification herein at page 8, lines 19-23 and the paragraph bridging pages 26 and 27, a water-dispersed polyurethane substantially free from organic solvents is used in the present invention to avoid the adverse effect of organic solvents such as deterioration of color development, occurrence of color variation, increase of switching

loss, dissolution and release of pigments, etc. These beneficial effects from using a water-dispersed polyurethane would not be expected from Higuchi et al, which is completely silent as to avoiding the use of organic solvents.

Regarding the Examiner's finding with respect to the coating layer of Higuchi et al, Applicants submit that the coating layer should be clearly distinguished from the polyurethane which is impregnated into the artificial leather. In Fig. 1 of Higuchi et al, the coating layer is indicated by "D" while the binder (impregnated polyurethane) is indicated by "C" (column 6, lines 37-38). In fact, Higuchi et al distinguishes the coating layer from the binder (polyurethane impregnated inside the fibrous substrate), as can be easily ascertained by their disclosure of "[u]niting the coating layer with the substrate sheet" (column 6, line 1). Therefore, the elastomeric polymer A containing the pigment B of the present claims must be compared with the binder of Higuchi et al, and the Examiner's arguments based on the coating layer of Higuchi et al are irrelevant to the presently-recited elastomeric polymer A which is impregnated in the three-dimensional entangled body.

Ashida et al is relied upon by the Examiner only for a disclosure of embedding pigment in superfine fibers. In Ashida et al, polyurethane is also impregnated into a fibrous entangled nonwoven fabric in the form of a solution in dimethylformamide (Example 1 and Comparative Example 1). Therefore, Ashida et al does not remedy the above-discussed deficiency of Higuchi et al to avoid the use of organic solvents.

Takeyama et al also discloses impregnating the elastomeric polymer into nonwoven fabrics in the form of solution containing an organic solvent (column 8, line 47ff).

Finally, Mast et al relates to a process for the bath pigmentation of leather and, like Takeyama et al, is drawn to the pigmentation of already-formed leather. Mast et al is relied on by the Examiner for a disclosure of a particular pigment particle size. However, Mast et al does not remedy any of the deficiencies in the combination of the other prior art.

As discussed above, in the applied prior art where polyurethane is impregnated into a fibrous body, it is in the form of solution containing an organic solvent. There is neither disclosure nor suggestion in the applied prior art to employ a water-dispersed polyurethane substantially free from organic solvents.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently active claims in this application are now believed to be in immediate condition for allowance. The Examiner is respectfully requested to rejoin the non-elected method claims, and in the absence of further grounds of rejection, pass this application to issue with all pending claims.

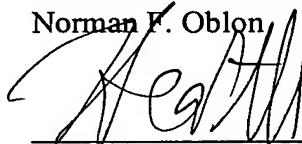
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